Study supports why healthy pets need a complete urinalysis

1 in 3 complete urinalyses from reportedly healthy pets uncover need for further consideration or workup

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Overview

Urinalysis is a routine laboratory test, typically reserved for patients who present with urinary and/or kidney issues.[1] The goal of the study was to establish the frequency of abnormalities in canine and feline urine samples from apparently healthy patients across all age groups, and thereby reaffirm the value of a complete urinalysis as part of the minimum database for healthy patients.

Summary of key findings

This study confirmed the value of performing a complete urinalysis in healthy dogs and cats of all ages, with some notable trends:

- **1 in 3 healthy patients tested had at least 1 abnormal finding that warranted further consideration and/or workup**.
- **1 in 10 patients had 2 or more abnormal findings**.
- Urinary abnormalities generally increased with age; **however, young dogs had a higher abnormality rate than the rate observed in adult dogs.**

Methodology

In this prospective study, 3,177 fresh urine samples were analyzed on the IDEXX VetLab® UA™ Analyzer and the IDEXX SediVue Dx® Urine Sediment Analyzer by 487 participating veterinary practices in North America.

Each patient included in this study was reported to be healthy by the practice staff and/or pet owner at the time of the sample collection. Demographic data recorded included species and age. Six parameters from the complete urinalysis were included in this analysis using the predetermined clinical thresholds noted in table 1. The parameters included were protein, glucose, and blood detected using a IDEXX UA™ Strips and RBC, WBC, and bacteria results from the IDEXX SediVue Dx® Urine Sediment Analyzer. Blood detected by the IDEXX UA Strips and RBCs detected by the SediVue Dx analyzer were combined and considered a single abnormality.

The remaining parameters were not evaluated in this study for reasons including the need for additional patient information to determine significance and/or infrequent observation of the abnormal finding.

Test method	Parameter	Clinical threshold
IDEXX UA Strips	Protein	2+ or 3+ with no evidence of inflammation based on RBC <30/HPF, WBC ≤5/HPF, No Bacteria, and Blood <3+; or Trace or 1+ with previously mentioned criteria and USG <1.012
	Glucose	1+, 2+, or 3+
	Blood	3+ or 4+
IDEXX SediVue Dx Urine Sediment Analyzer	RBC	>5/HPF
	WBC	>5/HPF
	Bacteria	Present

Table 1. Parameters and predetermined clinical thresholds defining abnormality.

The patient population was segmented by age group (tables 2a, 2b) to determine if any trends were present across age groups for both dogs and cats.

While this study was not intended to determine if collection methods impact results, collection methods were evaluated by species to determine if samples collected by cystocentesis had significantly different abnormalities than voided samples.

Dogs	Total
Young (<3 years)	512
Adult (3–6 years)	670
Senior (7–10 years)	853
Geriatric (11+ years)	591
Unknown	66
Total number of dogs	**2,692**

Table 2a. Dogs by age group.

Cats	Total
Young (<2 years)	64
Adult (2–8 years)	180
Senior (9–13 years)	123
Geriatric (14+ years)	85
Unknown	33
Total number of cats	**485**

Table 2b. Cats by age group.

Key findings

The frequency of abnormalities identified in apparently healthy dogs and cats, across all age groups, strongly **supports the inclusion of a complete urinalysis to the minimum diagnostic database.**

- **1 in 3 healthy patients tested had at least 1 abnormal finding that warranted further consideration and/or workup:**
  - 33% of dogs and 45% of cats had 1 or more abnormal finding.
  - Geriatric dogs, as compared to the other age groups, had a slightly higher frequency where 1 or more abnormality was identified.
  - The frequency of 1 or more abnormal finding in cats was comparable across all age groups.
- **1 in 10 patients had 2 or more abnormal findings.**
  - Young dogs, as compared to adult dogs, had a slightly higher frequency where 2 or more abnormalities were identified. The observation rate in young dogs was comparable to senior and geriatric dogs.
  - Urinary abnormalities generally increased with age; **however, young dogs had a higher abnormality rate than the rate observed in adult dogs.**
- **Sample collection method had minimal impact to the conclusions from this study.**
  - 88% of canine and 28% of feline samples were voided.
  - 9% of canine and 61% of feline samples were collected by cystocentesis.
  - 3% of canine and 11% of feline samples submitted did not include a collection method.
  - While the frequency of blood and/or RBCs observed in samples collected by cystocentesis was greater than voided samples, the frequency of two or more abnormalities was comparable for both voided and cystocentesis samples.

Discussion

The complete urinalysis provides unique and essential information about the health and function of the lower and upper urinary system, including insights into the patient's hydration status, and appropriateness of the kidneys' urine concentrating ability relative to increases in symmetric dimethylarginine (SDMA) and creatinine. In particular, changes in the urine sediment predict the likelihood of urinary tract inflammation, infection, stones, or neoplasia that are contributing to observed clinical signs, or of the presence of a clinically occult but potentially progressive kidney or lower urinary tract condition. In addition, a complete urinalysis helps identify concurrent disease(s) of other organ systems that might otherwise be overlooked, such as early hemolytic or hepatic disease that is associated with bilirubinuria, or metabolic dysfunction that produces uncommon crystalluria and uroliths, and/or acid base disturbance.

The data presented here shows that urinary abnormalities were common in apparently healthy, clinically normal dogs and cats (n = 3,177). Approximately 1 in 3 patients had at least one abnormality and approximately 1 in 10 patients had two or more abnormalities in a screening urinalysis that merited further consideration and possibly additional workup. Analyzing fresh urine samples, independent of collection method, during the patient visit provides several additional benefits, including a more efficient and comprehensive visit while minimizing the risk of sample degradation or post-collection artifacts confounding the interpretation.[2]

Study findings support including a complete urinalysis in preventive care screenings, even if the patient is seemingly healthy. These indications are additive to the regular recommendations to perform a complete urinalysis for patients that are clinically ill or being monitored as part of an ongoing health plan. Example cases include:

Investigating

- Kidney disease
- Lower urinary tract disease
- Polyuria/polydipsia
- Vomiting
- Diarrhea
- Nonspecific signs such as lethargy, anorexia, or "just not himself/herself"

Monitoring

- Kidney disease
- Lower urinary tract disease
- Urinary tract infection
- Urolithiasis
- Liver disease

In most cases, patients should benefit from early diagnosis of urinary and other conditions, since clinicians can intervene promptly, with targeted and specific treatments, thereby increasing the likelihood of a good outcome. This is true for many infectious processes, such as pyelonephritis and leptospirosis, and for progressive problems with significant morbidity and mortality, such as immune-mediated hemolytic anemia. While early diagnosis may not always change the treatment and management of patients, pet owners can be properly informed about the options and prognosis for their pet. The return on investment from a complete urinalysis is significant and justifies the inclusion as a standard part of the minimum database across all visit types. Urinalysis is indicated for well and sick patients, along with a complete chemistry panel, including electrolytes and IDEXX SDMA testing, and a complete blood count (CBC).

References

1. As determined by a survey of 671 veterinary practices in the United States in 2012. Data on file at IDEXX Laboratories, Inc. Westbrook, Maine USA.
2. Albasan H, Lulich JP, Osborne CA, Lekcharoensuk C, Ulrich LK, Carpenter KA. Effects of storage time and temperature on pH, specific gravity, and crystal formation in urine samples from dogs and cats. *JAVMA*. 2003;222(2):176–179.